

## ABSTRACT OF THE INVENTION

The present invention relates to a purified, easily produced poly- $\beta$ -1 $\rightarrow$ 4-N-acetylglucosamine (p-GlcNAc) polysaccharide species. The p-GlcNAc of the invention is a polymer of high molecular weight whose constituent monosaccharide sugars are attached in a  $\beta$ -1 $\rightarrow$ 4 conformation, and which is free of proteins, and substantially free of single amino acids, and other organic and inorganic contaminants. In addition, derivatives and reformulations of p-GlcNAc are described. The present invention further relates to methods for the purification of the p-GlcNAc of the invention from microalgae, preferably diatom, starting sources. Still further, the invention relates to methods for the derivatization and reformulation of the p-GlcNAc. Additionally, the present invention relates to the uses of pure p-GlcNAc, its derivatives, and/or its reformulations.

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